

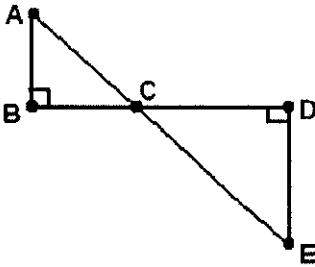
2.14 Angle Proofs

⑧ Given:

$$m\angle A + m\angle B + m\angle ACB = 180^\circ$$

$$m\angle D + m\angle E + m\angle DCE = 180^\circ$$

Prove: $\angle A \cong \angle E$



*Right Angle Congruence Theorem:

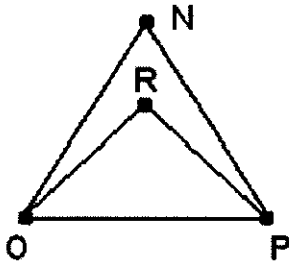
All right angles are congruent.

Statements	Reasons
① $m\angle A + m\angle B + m\angle ACB = 180^\circ$ $m\angle D + m\angle E + m\angle DCE = 180^\circ$	① Given
② $\angle ACB \cong \angle DCE$	② vertical angles theorem
③ $m\angle ACB = m\angle DCE$	③ def. of \cong angles
④ $\angle B \cong \angle D$	④ right angles congruence theorem
⑤ $m\angle B = m\angle D$	⑤ def. of \cong angles
⑥ $m\angle A + m\angle B + m\angle ACB = m\angle D + m\angle E + m\angle DCE$	⑥ Substitution Prop.
⑦ $m\angle A + m\angle D + m\angle DCE = m\angle D + m\angle E + m\angle DCE$	⑦ Substitution Prop.
⑧ $m\angle A = m\angle E$	⑧ Subtraction Prop.
⑨ $\angle A \cong \angle E$	⑨ def. of \cong angles

- (10) Given: $\angle NOP \cong \angle NPO$
 $\angle ROP \cong \angle RPO$

Prove:

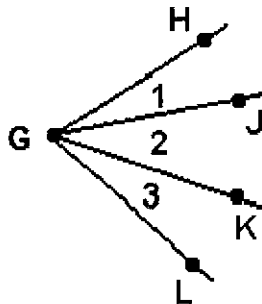
$$\angle NOR \cong \angle NPR$$



Statements	Reasons
① $\angle NOP \cong \angle NPO$ $\angle ROP \cong \angle RPO$	① Given
② $m\angle NOP = m\angle NPO$ $m\angle ROP = m\angle RPO$	② Def. of \cong angles
③ $m\angle NOR + m\angle ROP = m\angle NOP$ $m\angle NPR + m\angle RPO = m\angle NPO$	③ Angle Addition Postulate
④ $m\angle NOR + m\angle ROP = m\angle NPR + m\angle RPO$	④ Substitution Prop.
⑤ $m\angle NOR + m\angle RPO = m\angle NPR + m\angle RPO$	⑤ Substitution Prop.
⑥ $m\angle NOR = m\angle NPR$	⑥ Subtraction Prop.
⑦ $\angle NOR \cong \angle NPR$	⑦ def. of \cong angles

④ Given: $\angle HGK \cong \angle JGL$

Prove: $\angle 1 \cong \angle 3$



Statements	Reasons
1. $\angle HGK \cong \angle JGL$	1. Given
2. $m\angle HGK = m\angle JGL$	2. def. of \cong angles
3. $m\angle 1 + m\angle 2 = m\angle HGK$ $m\angle 2 + m\angle 3 = m\angle JGL$	3. angle addition postulate
4. $m\angle 1 + m\angle 2 = m\angle 2 + m\angle 3$	4. substitution prop.
5. $m\angle 1 = m\angle 3$	5. subtraction prop.
6. $\angle 1 \cong \angle 3$	6. def. of \cong angles

(12) Given:

$\angle FEH$ is supplementary to $\angle EHG$

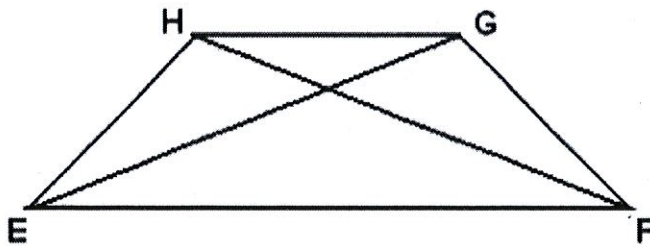
$\angle EFG$ is supplementary to $\angle FGH$

$\angle EHF \cong \angle EGF$

$\angle FHG \cong \angle EGH$

Prove:

$\angle FEH \cong \angle EFG$



Statements	Reasons
① $\angle FEH$ is supplementary to $\angle EHG$ $\angle EFG$ is supplementary to $\angle FGH$ $\angle EHF \cong \angle EGF$ $\angle FHG \cong \angle EGH$	① Given
② $m\angle EHF = m\angle EGF$ $m\angle FHG = m\angle EGH$	② Def. of \cong angles
③ $m\angle FEH + m\angle EHG = 180^\circ$ $m\angle EFG + m\angle FGH = 180^\circ$	③ def. of supplementary
④ $m\angle EHG = m\angle EHF + m\angle FHG$ $m\angle HGF = m\angle HGE + m\angle EGF$	④ angle addition postulate
⑤ $m\angle EHG = m\angle EGF + m\angle EGH$	⑤ Substitution
⑥ $m\angle EHG = m\angle HGF$	⑥ Substitution
⑦ $\angle EHG \cong \angle HGF$	⑦ def. of \cong angles
⑧ $\angle FEH \cong \angle EFG$	⑧ Congruent supplements theorem